

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



In re Patent Application of  
Tomoyuki Ohzeki

Application No.: 10/771,674

Group Art Unit: 1795

Confirmation No.: 3597

Examiner: Thorl Chea

Filed: February 5, 2004

Docket No.: FS-F03227-01

For: **PHOTOTHERMOGRAPHIC MATERIAL**

DECLARATION UNDER 37 C.F.R. §1.132

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

I, Tomoyuki Ohzeki, do declare and state as follows:

I graduated from Waseda University with a Master's Degree in Science, Department of Chemistry in March 1988;

I joined Fuji Photo Film Co., Ltd. (now FUJIFILM Corporation) in April 1988, and from 1989 to 1997, I was engaged in research and development in the field of silver halide photographic photosensitive materials. Since 1998, I have been engaged in research and development in the field of photothermographic materials and am a person of at least ordinary skill in the art; and

I am familiar with the Office Action of September 24, 2007, and understand the Examiner's rejections therein.

The following additional comparative experiments were carried out by me or under my supervision in order to make the advantages of the invention more clear.

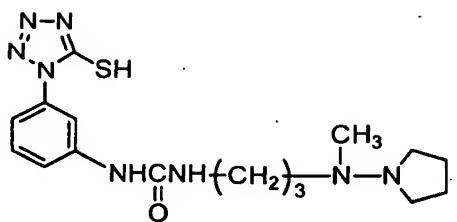
## EXPERIMENTS

### 1. Preparation of photothermographic materials

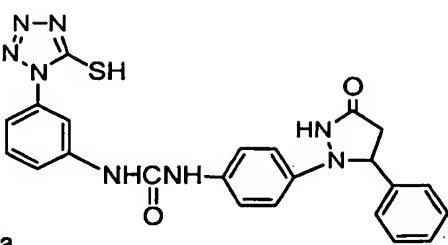
Additional samples were prepared as similar to sample No. 1 of Example 1 in the specification, or sample No. 101 of Example 2 in the specification, except that a silver iodide content of a photosensitive silver halide, a compound having adsorptive group and reducible group, a content of silver behenate, a binder and iridium content in the silver halide were changed, respectively, as shown Table A and B. A compound having adsorptive group and reducible group was used at  $8 \times 10^{-3}$  mol per 1 mol of silver halide. A binder was replaced at an equal weight %.

Compound Nos. 3, 15, 17 and 20 having an adsorptive group and a reducible group are comparative compounds disclosed in Okada (US 6,120,983). Compound Nos. 3a, 15a, 17a and 20a are compounds according to the invention which have a similar chemical structure to the compound Nos. 3, 15, 17 and 20, except having a 3-pyrazolidone group as the reducible group, respectively. The chemical structures of these compounds are shown below.

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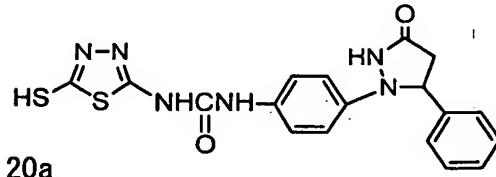
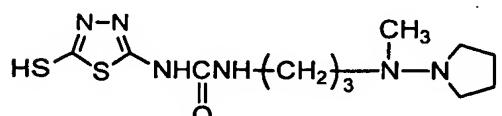


3a



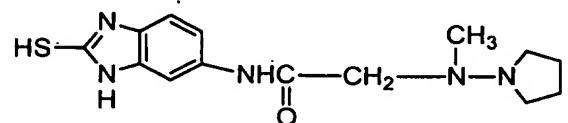
17

20

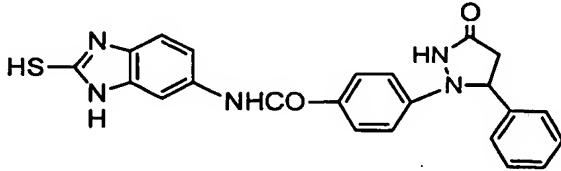
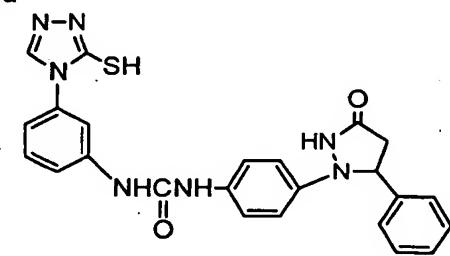


20

15



15a



## 2. Evaluation of the samples

The obtained photothermographic materials were evaluated by a thermal developing process and an evaluation method similar to that described in Examples 1, 2 of the specification. The results obtained are shown in Table A and B.

From the results shown in Table A, the following can be seen:

1) By considering the data among sample Nos. a to h, wherein a silver iodide content of a silver halide is 100 mol%, a silver behenate content is 30 mol% and Tg of a binder is 67°C, sample Nos. b, d, f and h of the invention which include a compound having an adsorptive group and a reducible group according to the invention resulted unexpectedly remarkably high sensitivity with low fog and also unexpectedly

remarkably improved dark stability of developed images as compared with comparative sample Nos. a, c, e and g which contain a compound described in Okada.

2) Furthermore, sample Nos. b, d, f and h of the invention resulted in unexpectedly remarkably high sensitivity with low fog and also unexpectedly remarkably improved dark stability of developed images as compared with comparative sample Nos. j, l, n and p, wherein a silver iodide content of a silver halide is 100 mol% and a compound having an adsorptive group and a reducible group according to the invention is contained, but a silver behenate content is 90 mol% and Tg of a binder is 29 °C.

3) By considering the data among sample Nos. q to x, wherein a silver iodide content of a silver halide is 30 mol%, a silver behenate content is 80 mol% and Tg of a binder is 67°C, sample Nos. r, t, v and x of the invention which include a compound having an adsorptive group and a reducible group in the invention resulted in unexpectedly remarkably high sensitivity with low fog and also unexpectedly remarkably improved image stability of developed images as compared with comparative sample Nos. q, s, u and w which contain a compound described in Okada.

From the results shown in Table B, the following can be seen:

4) By considering the data among sample Nos. A to H, wherein a silver iodide content of a silver halide is 2 mol%, sample Nos. B, D, F and H of the invention which include a compound having an adsorptive group and a reducible group according to the invention resulted unexpectedly remarkably high sensitivity, and also unexpectedly remarkably improved image stability and raw storability as compared with comparative sample Nos. A, C, E and G which contain a compound described in Okada.

5) Furthermore, sample Nos. J, L, N and P of the invention, wherein a silver iodide content of a silver halide is 100 mol% and a compound having an adsorptive group and a reducible group according to the invention is contained, resulted in unexpectedly remarkably high sensitivity, and also unexpectedly remarkably improved image stability and raw storability as compared with comparative sample Nos. I, K, M and O, wherein a compound having an adsorptive group and a reducible group described

in Okada is contained.

Therefore, it is clearly understood that a photothermographic material according to the present invention comprising a compound having a group adsorptive to silver halide and 3-pyrazolidone group as a reducible group, a silver behenate content of the non-photosensitive organic silver salt is in the range of from 30% by mole to 80% by mole, and the binder has a glass transition temperature (Tg) of 45°C or higher results in unexpectedly remarkably high sensitivity with low fog and also unexpectedly remarkably improved image stability of developed images and raw storability.

Therefore, it would not have been obvious for a worker of ordinary skilled in the art at that time the invention was made to create the invention based on Okada (US 6,120,983) or the combination of Okada (US 6,120,983), Tsuzuki (US 5,677,121), Siga (US 4,332,889), Tsukada (2002/0058220A1), Winslow et al (US 5,891,615) and Purol et al (US 5,236,816).

Table A

Photothermographic material No.	Silver iodide content (mol%)	Compound having adsorptive group and reducible group	Content of silver behenate (mol%)	Binder (T g/°C)	Sensitivity	Fog	Dark stability ( $\Delta D_{min}$ )	Remarks
1	100	-	25	PVB(67)	100	0.24	0.10	Comparative
1'	100	-	30	PVB(67)	97	0.22	0.08	Comparative
a	100	3	30	PVB(67)	175	0.35	0.12	Comparative
b	100	3a	30	PVB(67)	218	0.23	0.08	Invention
c	100	15	30	PVB(67)	176	0.33	0.15	Comparative
d	100	15a	30	PVB(67)	225	0.22	0.08	Invention
e	100	17	30	PVB(67)	168	0.34	0.14	Comparative
f	100	17a	30	PVB(67)	215	0.23	0.08	Invention
g	100	20	30	PVB(67)	155	0.36	0.13	Comparative
h	100	20a	30	PVB(67)	221	0.22	0.08	Invention
i	100	3	90	SBR(29)	88	0.32	0.14	Comparative
j	100	3a	90	SBR(29)	125	0.28	0.09	Comparative
k	100	15	90	SBR(29)	92	0.29	0.12	Comparative
l	100	15a	90	SBR(29)	131	0.27	0.10	Comparative
m	100	17	90	SBR(29)	90	0.23	0.13	Comparative
n	100	17a	90	SBR(29)	120	0.29	0.10	Comparative
o	100	20	90	SBR(29)	86	0.31	0.12	Comparative
p	100	20a	90	SBR(29)	128	0.30	0.09	Comparative
q	30	3	80	PVB(67)	75	0.28	0.07	Comparative
r	30	3a	80	PVB(67)	115	0.22	0.04	Invention
s	30	15	80	PVB(67)	78	0.27	0.09	Comparative
t	30	15a	80	PVB(67)	120	0.21	0.03	Invention
u	30	17	80	PVB(67)	79	0.29	0.08	Comparative
v	30	17a	80	PVB(67)	102	0.22	0.03	Invention
w	30	20	80	PVB(67)	81	0.30	0.08	Comparative
x	30	20a	80	PVB(67)	116	0.23	0.04	Invention

Table B

Photothermographic material No.	Silver iodide content (mol%)	Compound having adsorptive group and reducible group	Iridium (mol/molAg)	Sensitivity	Image stability ( $\Delta D_{min1}$ )	Storability ( $\Delta D_{min2}$ )	Remarks
101	2	-	$2.1 \times 10^{-5}$	100	0.15	0.03	Comparative
A	2	3	$2.1 \times 10^{-5}$	185	0.06	0.02	Comparative
B	2	3a	$2.1 \times 10^{-5}$	208	0.04	0.01	Invention
C	2	15	$2.1 \times 10^{-5}$	175	0.08	0.02	Comparative
D	2	15a	$2.1 \times 10^{-5}$	215	0.04	0.01	Invention
E	2	17	$2.1 \times 10^{-5}$	172	0.09	0.02	Comparative
F	2	17a	$2.1 \times 10^{-5}$	207	0.05	0.01	Invention
G	2	20	$2.1 \times 10^{-5}$	168	0.08	0.02	Comparative
H	2	20a	$2.1 \times 10^{-5}$	211	0.04	0.01	Invention
I	100	3	$3.0 \times 10^{-3}$	197	0.05	0.02	Comparative
J	100	3a	$3.0 \times 10^{-3}$	242	0.02	0.01	Invention
K	100	15	$3.0 \times 10^{-3}$	188	0.07	0.02	Comparative
L	100	15a	$3.0 \times 10^{-3}$	235	0.03	0.01	Invention
M	100	17	$3.0 \times 10^{-3}$	186	0.08	0.02	Comparative
N	100	17a	$3.0 \times 10^{-3}$	238	0.02	0.01	Invention
O	100	20	$3.0 \times 10^{-3}$	178	0.07	0.02	Comparative
P	100	20a	$3.0 \times 10^{-3}$	236	0.03	0.01	Invention

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: November 5, 2007

Tomoyuki Ohzeki

Tomoyuki Ohzeki